

MUSLIM CONTRIBUTIONS TO THE MODERN WORLD



In Islam, seeking knowledge is akin to worship:

*"Whoever seeks a way for pursuing knowledge,
Allah will facilitate his admission to Paradise"*

[Prophet Muhammad]

From the dawn of Islam, Muslim scholars have made significant contributions to the world of learning. Indeed, from the 7th Century until the 15th Century, Muslims were the torchbearers of human civilisation. After the fall of the Roman Empire, Europe fell into the Dark Ages but Muslim scholars succeeded in preserving the classical wisdom of Ancient Greece and Rome. Due to their thirst for knowledge Muslims then went on to make spectacular advances in a wide spectrum of subjects, including mathematics, astronomy, geography, medicine, physics, chemistry, biology, botany, and veterinary science. Believing in the unity behind creation, many Muslim scholars recognised the close affinity between academic disciplines, and it was not unusual for a physician to also be an accomplished mathematician, philosopher or astronomer. Scholarship at the height of Muslim civilisation succeeded in combining the energies and genius of people from all over the known-world. In many Muslim cities, there was truly an international citizenry. The interaction between so many people from different religious and ethnic backgrounds was facilitated by Muslims' sense of hospitality and tolerance of other ways of life.

After nearly 900 years of intellectual leadership, however, internal bickering and complacency saw the influence of Muslims stagnate and then decline.

It would, nevertheless, be true to say that advances made by Muslim scholars from such seats of learning as Baghdad, Muslim Spain and Cairo laid the foundations for Europe's 'Renaissance' [intellectual re-awakening] in the Middle Ages. This, in turn, fuelled the Industrial Revolution that has eventually given rise to the scientific and technical achievements of today.

Aims:

For students to be able to ...

- be aware that Islamic civilisation has had a tradition of pluralism
- understand that Muslim scientific and technical advances had a significant impact on the modern world
- reflect on how such advances have an impact on their own lives
- see today's society more clearly by holding it against a rich historical backcloth

Activities:

1. Exploring Human Rights, Citizenship and Islam

Arrange the class into groups and ask each group to read one of the 'Islamic humanitarian charters' on the following page. Invite them to discuss it and extract some key principles that underpin a peaceful, pluralistic society. Each group to then report back to the class about their 'charter' stating the principles they have identified. At the end, combine and refine the principles from all the groups to arrive at an overall class list of key points, in ranking order, which are vital if different communities are to live peacefully together.

Examine life in Britain today. Explore, first through discussion and then in writing, "Is the UK a successful multi-racial and multi-faith society?" Can we learn any lessons from any of the 'Islamic charters'?

2. Did You Know?

Examples of Muslim contributions to the modern world:

Students in pairs read through the examples on pages 3 and 4 of this pdf. Ask them to choose three facts that particularly interest them and ask them to reflect on how important these advances are to life today. Encourage them to imagine how life today might be different if those advances had not been made. Each pair could report back to the class with their thoughts and reflections.

Ask the pupils to assemble a collage which summarises the impact Islamic civilisation has had upon life today.

HUMAN RIGHTS, CITIZENSHIP AND ISLAM

Islam has always championed the cause of responsible citizenship, and fosters tolerance and cooperation. It teaches that the human rights of all, regardless of religion, race and gender, are to be respected.

Below are some examples of how these rights and duties have been enshrined in the Islamic tradition.

Final Sermon of Prophet Muhammad [pbuh]

Prophet Muhammad [pbuh], in his Final Sermon, asserts the inherent dignity of all human beings. An extract states:

"Allah says, 'O People We have created you from one male and one female and made you into tribes and nations, so as to be known to one another. Verily, in the sight of Allah, the most honoured amongst you is the one who is most God-fearing. There is no superiority for an Arab over a non-Arab and for non-Arab over an Arab, nor for the white over the black, nor for the black over the white, except in God-consciousness."

Umar's Charter of Rights in Jerusalem

When Jerusalem came under the rule of the Muslims, after the defeat of Byzantium, Caliph Umar went to accept the surrender, whereupon he immediately granted to the people what was known as the Charter of Rights, in the year 638CE. This charter emphasises the basic principles of liberty, security, and freedom of faith which are central to Islam:

"In the name of God, the Merciful, the Compassionate. This is the security which Umar, the Servant of God, the Commander of the Faithful, grants to the people of Aylia (Jerusalem). He grants to all, whether sick or sound, security for their lives, their possessions, their churches, and their crosses, and for all that concerns their religion. Their churches shall neither be changed into dwelling places nor destroyed, neither shall they, nor their appurtenances, nor any of their possessions, be in any way diminished; nor shall any constraint be put on them in the matter of their faith; nor shall any one of them be harmed."

The Covenant of Medina

When Prophet Muhammad [pbuh] established his government in Medina, it was at a time of inter-tribal and inter-religious tension. To encourage peace, reconciliation and security, the Prophet [pbuh] declared 'the Covenant of Medina' which laid down broad principles on which cordial relations could be established between Muslims and non-Muslims. Protection of life and property, and freedom of thought and of worship were guaranteed. The Covenant stated that:

"The Jews shall bear their public expenses and so will the Muslims. Each shall assist the other against any violator of this covenant. Their relationship shall be one of mutual advice and consultation, and mutual assistance and charity rather than harm and aggression ...

... Charity and goodness are clearly distinguishable from crime and injury, and there is no responsibility except for one's own deeds. God is the guarantor of the truth and good will of this covenant. This covenant shall constitute no protection for the unjust or criminal."

EXAMPLES OF MUSLIM CONTRIBUTIONS TO THE MODERN WORLD

Progress in many branches of knowledge often builds upon the discoveries of earlier generations and civilisations.

All dates shown are CE
[Common Era]

Did you know that ... ?

The first ever university to be built in the world was Al Azhar University in Cairo. The mosque was built in 972 during the reign of the Caliph Al-mu'izz. By 975, it had become established as a major centre of learning.



In mathematics

The numbers we use today (1,2,3,4,5,6,7,8,9 and 0) are called **Arabic numbers**. Learned from the Indians, Muslim mathematicians brought them to Europe around the 12th Century which revolutionised the study of mathematics and science. This much easier system replaced the cumbersome Roman numeral system which did not have a symbol for zero.

'Algebra' was invented by the Muslim mathematician, **Muhammad Abu Musa Al-Khwarizmi** [780-850] His book entitled 'Hisabal-jabr wa'l-Muqabala' was translated into Latin in the 12th Century and was the most important mathematical text in Europe for the next 400 years.

The well-known formula of trigonometry was laid down by **Abu'l-Wana Buzjani** [died 940].

$$\sin(A + B) = \sin A \cos B - \cos A \sin B$$

$$\sin(A - B) = \sin A \cos B + \cos A \sin B$$

... and problem solving

After famine struck Arabia around 640, **Caliph Umar** ordered a canal to be dug which connected the Nile to the Red Sea to allow grain to be quickly sent from Egypt. The 69 mile long canal was completed in only 6 months.

Scientific invention:



The foundations of the device that today we call the camera were laid down by **Ibn al-Haytham of Cairo** [Egypt] [965 –1039]. Known in the West as Alhazen, and also referred to as the "father of optics", he was a leading authority on optics and made great advances in the scientific understanding of how the eye functions and of the behaviour of light.

Binoculars were also invented by Ibn al-Haytham.



Many scientific and medical expressions find their roots in **Arabic** eg alcohol [from al-kuhul]; chemistry [from al-kimiya]; arsenic [from al-zirnikh]; alkaline [from al-qali]; camphor [from kafur] and so on.

In Medicine ...

The first scientist to identify measles was **Al-Razi of Persia** [Iran] [824-932]. Known to the West as Rhazes, he was also the first to divide chemical substances into groups, termed mineral, vegetable and animal. He wrote extensively about philosophical and medical matters. His works were translated into Latin, influencing European physicians and scholars through The Middle Ages.

The standard book of medicine in Europe for 500 years was written by **Ibn Sina** [980-1037]. Born in Bukhara in Turkestan in Central Asia, Ibn Sina became known in Europe as Avicenna and also as the 'Prince of Physicians', and is remembered as the greatest Muslim physician. His comprehensive book 'the Canon of Medicine' [which contained over a million words] was translated into Latin and used in European universities until the 17th Century as a standard medical text.

The **pulmonary circulation system** [the minor circulation of blood] was first discovered by **Ibn an-Nafis** of Damascus and Cairo [1210-1298]. He explained how blood is pumped from the heart to the lungs, where it absorbs oxygen, and then travels back to the heart and thereafter releases the oxygen in the upper part of the body.

The first hospital in the world for people suffering from mental illness was established in Baghdad in 765.

In Spain ...

Muslims ruled most of Spain [al Andalus] for nearly 800 years [from 711 to 1492] during which time great scientific and technical advances were made.

Whilst London was largely a settlement of ramshackle buildings, the city of Cordoba [the capital of Muslim Spain] had street lighting, pavements, public baths and public libraries. This was a time in which Muslim, Jew and Christian lived and worked side by side; scholars from all over Europe and beyond travelled to study at the universities of Cordoba, Seville, Malaga and Granada. Architecture in Spain at this time flourished, with notable examples being the mosque of Cordoba, and the Al Hambra Palace in Granada [pictured below].



In history and geography

The first work on world history, written in 30 volumes, was produced by Al-Mas'udi [died 965].

The first map of the earth was commissioned by Caliph Mamun al-Rashid in 831. Muslims had a religious motivation in studying geography, because of their duty to perform hajj which often involved travelling long distances.

In astronomy ...

Muslim astronomers established sophisticated observatories, discovering many new stars and making careful studies of planetary motion.

Al-Biruni of Afghanistan [973-1048] measured the distances of many stars and planets from earth. He also discovered the magnitude of the earth's circumference.

In travel ...

Muslims became expert navigators. An advanced understanding of astronomy helped Muslims to develop the astrolabe, a precision-made instrument used in navigation, which measured the altitude of stars.



An astrolabe containing geared calendar work

Muslims were great explorers, travellers and merchants. Helped by navigational instruments such as the astrolabe, men such as Ibn Battuta travelled across the known world, making extensive journeys to Africa, India, China and beyond. Not only did Muslims bring back valuable silks and spices and other precious goods, they also acquired scientific and technical knowledge which they later made accessible to Europe.

The first authentic work on the northern pole of the earth was authored by Ibn Fadlun [died 921] who travelled north to Russia.

In architecture ...

The Taj Mahal was completed in 1648 by the Muslim Mughal ruler of India, Shah Jehan, in memory of his beloved wife, Mumtaz Mahal. It is widely acknowledged to be one of the architectural wonders of the world.

